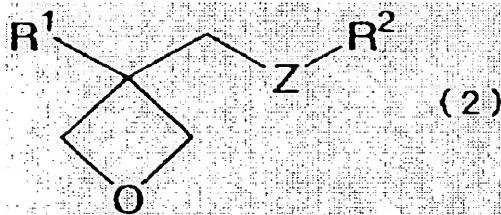


CLAIMS

What is claimed is:

1. A radiation curable composition comprising relative to the total weight of the composition
5 A 0-29 wt% of a cationically curable component having a linking aliphatic ester group
 B 10-85 wt% of an epoxygroup containing component other than A
 C 1-50 wt% of an oxetanegroup containing component
10 D 1-25 wt% of a multifunctional acrylate
 E a radical photoinitiator
 F a cationic photoinitiator.
2. The radiation curable composition according to claim 1, wherein component A comprises two cyclohexenoxide groups.
- 15 3. The radiation curable composition according to claim 1, wherein the amount of component A is between 0 and 15 wt%
4. The radiation curable composition according to claim 1, wherein component B comprises a glycidylether group
5. The radiation curable composition according to claim 1, wherein the composition comprises relative to the total weight of the composition
20 30-75 wt% of component B having a glycidylether group, 10-25 wt% of component C and 2-15 wt% of the multifunctional acrylate compound D.
6. The resin composition according to claim 4, wherein the molar ratio of oxetane to glycidylether is between 0.1 and 1.5.
- 25 7. The radiation curable component according to claim 1, wherein the oxetane is chosen from the group consisting of components defined by formula 2,



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wherein R¹ is a C1-C4 alkyl group, Z = Oxygen and R² = H, a C1-C8 alkyl group or a phenylgroup;

35 3-ethyl-3-hydroxymethyloxetane, (3-ethyl-3-oxetanylmethoxy)methylbenzene, (3-ethyl-3-oxetanylmethoxy)benzene, 2-

ethylhexyl (3-ethyl-3-octanyl methyl) ether, 1,4-bis[(3-ethyl-3-octanylmethoxy)methyl]benzene, 1,2-bis[(3-ethyl-3-octanylmethoxy)methyl]ethane, 1,3-bis[(3-ethyl-3-octanylmethoxy)methyl]propane, ethylene glycol bis(3-ethyl-3-octanyl methyl) ether and bis(3-ethyl-3-octanyl methyl) ether.

5 8. The radiation curable composition according to claim 4, wherein the composition contains a glycidylether of hydrogenated bisphenol A.

9. The radiation curable composition according to claim 1, wherein the composition after full cure with actinic radiation and 60 min UV postcure has at least one of the following properties

10 (i) a flexural modulus in the range of 1000 to 100000 MPa;

15 (ii) an average elongation at break of at least 4%; and

10 (iii) a tensile strength of at least 25 MPa

10 10. The radiation curable composition according to claim 1, wherein a photo-fabricated article, obtained by repeating the steps of forming a layer of the composition and selectively irradiating the layer of the composition with actinic radiation, followed by postcure during 60 minutes in a postcure apparatus and subsequent conditioning of the article during 48 hours at a temperature of 20 °C and a relative humidity of 80% RH, has at least one of the following properties

20 (i) a flexural modulus in the range of 500 to 10000 MPa;

25 (ii) an average elongation at break of at least 3%; and / or

20 (iii) a tensile strength of at least 25 MPa

11. The resin composition according to claim 1, wherein the amount of components having linking aliphatic estergroups is less than 100 meq of ester links/100 g of composition.

25 12. The resin composition according to claim 1, wherein the amount of components having linking aliphatic estergroups is less than 25 meq of ester links/100 g of composition.

30 13. The resin composition according to claim 4, wherein the weight ratio of glycidylethers to epoxy-group containing components that have linking aliphatic ester groups is larger than 1.5

14. A radiation curable composition comprising relative to the total weight of the composition

35 A a cationically curable component having a linking aliphatic ester

group

B 10-85 wt% of an epoxygroup containing component other than A

C 1-50 wt% of an oxetanegroup containing component

D 1-25 wt% of a multifunctional acrylate

5 E a radical photoinitiator

F a cationic photoinitiator.

wherein the amount of components having linking aliphatic estergroups is less than 100 meq of ester links/100 g of composition.

15. A radiation curable composition, comprising an oxetane, a glycidylether, a cationic photoinitiator, wherein the composition after cure with actinic radiation and 60 min UV postcure shows the following properties:

(i) a water absorption of less than 1 wt% after exposure of a part, having a length of 10 cm, a height of 1 cm and a width of 1 cm during 48 hours at a temperature of 37°C at a relative humidity of 90%

15 (ii) a flexural modulus in the range of 500 to 10000 MPa; and

(iii) an average elongation at break of at least 3%.

16. The radiation curable composition of claim 15, wherein the composition comprises relative to the total weight of the composition from 1-29 wt% of the oxetane compound, 10-85 wt% of the glycidylether, 1-25 wt% of a multifunctional acrylate compound, a radical photoinitiator and a cationic photoinitiator.

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17. A radiation curable composition comprising relative to the total weight of the composition

A 0-25 wt% of a component having a linking estergroup and two cyclohexeneoxide groups

25 B 10-85 wt% of an epoxygroup containing component other than A

C 1-29 wt% of an oxetanegroup containing component

D 1-25 wt% of a multifunctional acrylate

E 0,1-10 wt% of a radical photoinitiator

30 F 0,1-10 wt% of a cationic photoinitiator

wherein a photo-fabricated article, obtained by repeating the steps of forming a layer of the composition and selectively irradiating the layer of the composition with actinic radiation, followed by postcure during 60 minutes in a postcure apparatus and subsequent conditioning of the article during 48 hours at a temperature of 20 °C and a relative humidity of 80% RH, has at least one

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of the following properties

- (i) a flexural modulus in the range of 500 to 10000 MPa;
- (ii) an average elongation at break of at least 3%; and
- (iii) a tensile strength of at least 25 MPa

5 18. The radiation curable composition according to claim 17, wherein the composition comprises 30-75 wt% of component B having a glycidylether group, 10-25 wt% of component C and 2-15 wt% of the multifunctional acrylate compound D.

10 19. A radiation curable composition, comprising an oxetane, a glycidylether, a cationic photoinitiator, wherein the composition is cured to an object with actinic radiation and 60 min UV postcure with actinic radiation and 60 min UV postcure and wherein the object has a ratio of $F_{wet}/F_{dry} > 0.5$, wherein F_{dry} is the Flexural Modulus of the flexural bar after cure and F_{wet} is the Flexural Modulus of a flexural bar after cure and a water treatment, wherein the object is submersed in water of 20 °C during 48 hours.

15 20. The composition according to claim 1, wherein the composition contains a filler.

21. A process for forming a three-dimensional article comprising:

- (1) coating a layer of a composition onto a surface, wherein the composition is used as defined in claim 1;
- (2) exposing the layer imagewise to actinic radiation to form an imaged cross-section, wherein the radiation is of sufficient intensity to cause substantial curing of the layer in the exposed areas;
- (3) coating a layer of the composition onto the previously exposed imaged cross-section;
- (4) exposing said thin layer from step (3) imagewise to actinic radiation to form an additional imaged cross-section, wherein the radiation is of sufficient intensity to cause substantial curing of the thin layer in the exposed areas and to cause adhesion to the previously exposed imaged cross-section;
- (5) repeating steps (3) and (4) a sufficient number of times in order to build up the three-dimensional article.

25 22. The process of claim 21, wherein the actinic radiation is in the range of 280-650 nm.

30 23. The process of claim 21, wherein the exposure energy is in the range of 10-150 mJ/cm².

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